

LOCKHEED AIRCRAFT CORPORATION		ENGINEERING STUDY <input checked="" type="checkbox"/>		CHANGE PROPOSAL <input type="checkbox"/>		LAC 253				
DATE February 8, 1966		AFFECTS: WSPO <input type="checkbox"/>		PROJECT <input checked="" type="checkbox"/>						
NAME OF MAJOR COMPONENT Ejection Seat		PART OR LOWEST SUBASSEMBLY Ejection Seat		PART NO. & MODEL OR TYPE U-2						
TITLE OF PROPOSAL : Stabilized Ejection Seat - Development Tests										
NATURE OF PROPOSAL : Phase I Mock-up tests of a low level Ejection Seat as proposed in SP-949 dated 1-24-66, same subject.										
REASON FOR PROPOSAL :  See SP-949										
ES	ESTIMATED COST AND TIME INVOLVED : SP-1923						STATINTL			
	ADDITIONAL FUNDING REQUIRED : Contingent upon FY '66 & FY'67 Funding									
CP	ESTIMATED COST FOR KITS OR PARTS :									
	ADDITIONAL FUNDING REQUIRED :									
ITEMS AFFECTED BY PROPOSAL : Development Only										
SAFETY	MISSION EFFEC- TIVENESS	PERFORM- ANCE	OPERATING PROCEDURE	INTER- CHANGE- ABILITY	WEIGHT OR WEIGHT & BALANCE	TOOLS & SUPPORT EQUIPMENT	MAINTENANCE PROCEDURE	SERVICE LIFE	FLIGHT MANUAL	MAINTENANCE MANUAL
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EST. MAN/HRS. REQ'D. TO ACCOMPLISH CHANGE IN FIELD										
SOURCE OF PARTS FOR KIT GFAE & Contractor					AVAILABILITY			WEEKS AFTER APPROVAL		
					See Page 3					
DISPOSITION OF SPARES AFFECTED None										
INITIATED BY : Customer					APPROVED : <del>WSPO</del>					
Approved For Release 2002/10/17 : CIA-RDP75B00285R000100170005-8										

## PHASE I

- A) M/U on Seat & transfer to Breadboard to test sequencing  
- ten (10) tests to be preformed.
- B) Hi-Altitude "Drop" tests to test seperation  
- three (3) tests to be preformed.
- C) Zero - Zero Tests  
- four (4) tests to be preformed.

## PRICE BREAKDOWN: SP-1923 Customer #1

- A) Engineering design & liaison
- B) Modification of 4 ea. GFAE T2V Ejection Seats to new configuration for tests.
- C) Mock-up, fabrication, assembly & procurement of parts & equipment required to support tests (17 total)
- D) Test program - 17 total tests as outlined above.

## TOTAL PHASE I - DEVELOPMENT TESTS

STATINTL

## NOTES:

- 1) The above does not include the following GFE parts & equipment:
  - a. 17 sets of misc. Initiators & Thrusters
  - b. 4 ea. 78" Stabilization Parachutes
  - c. 2 ea. MA-2 type Intergrated Torso Harnesses
  - d. 3 ea. Crank Assy's
  - e. 4 ea. Inertial Reel Lock Cylinders
  - f. 3 ea. Seat Recovery Chutes
  - g. 4 ea. T2V Ejection Seats
  - h. 2 ea. Anthromorphic Dummies
- 2) Customer will have the responsibility of providing A/C & test facilities for staging of "Drop" & zero - zero testing.
- 3) Rework and / or replacement of above GFAE will be subject to seperate negotiation.

(con't)

- 4) After completion of this development / feasibility testing, separate proposals will be submitted for Phase II & III of this program as outlined in SP-949.

SCHEDULE:

	<u>WEEKS</u>
A) GO-AHEAD	-0-
B) T2V Seats are at this facility	-0-
C) Misc. GFAC Initiators & Thrusters	-9-
D) Balance of GFAC equipment	-17-
E) First Test Seat Available for C-130 A/C	-21-
"Drop" tests	
F) Zero - Zero testing to commence	-25-
G) Tests complete	-31-
H) Testing results report to be submitted	-35-

25 October 1965

Subject: Modification Program To Improve Pilot Safety and Performance in 'Idealist Project'.

To: Chief, OSA.

A - Preliminary Considerations

1. Several attempts have been made over the past thirty months to initiate and follow through on a modification program designated to improve 'Idealist' pilot safety and performance. Although some minor gains have been made in this direction, no comprehensive model improvement program has been developed, supported and carried out to achieve this objective.

2. Recent events in the form of (1) a fatal accident (2) changes in commanding officers at [ ] and North Base and (3) prospects of a new "buy" in 'I' equipment have re-opened this issue and numerous conferences have been held on the matter during the past sixty days. Further definitive action to initiate such an improvement program requires a positive decision and approval by the Chief, OSA.

3. [ ] and the writer have conferred with operational unit personnel, contractors and OSA staff members in an attempt to accurately define the problem and provide the framework of a development and test program designed to meet the principal objectives. Two meetings with the contractors, Firewel and the Clark Companies have been held and proposals will shortly be on hand covering the various phases and objectives of the program. This present communication will summarize the current status of this particular project for the cognizance of those OSA personnel responsible for evaluating the program and making final recommendation to the Chief on its adoption.

B - Specific Objectives for Proposed Improvement Program

1. Safe ejection under zero altitude, zero velocity conditions. This model improvement program has been under study now for over a year but has been on dead center now for the past several months.

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2. Safer parachute descent rates after ejection under all conditions using a 35' canopy. This portion of the program is somewhat tied in with (1) and cannot logically proceed until a positive decision on the latter has been made.

3. Greater reliability and safety in the emergency oxygen and suit pressurization mechanisms through optimization of seatpack and accessory components. This particular phase of the program has been ready to proceed for six months but as yet no go-ahead has been given.

4. Improved pilot comfort and effectiveness to be achieved through the use of a full rather than the partial pressure suit. With the exception of the specific problem of modifying the aircraft components to accept the FPS, all details of this portion of the program have been adequately defined and are awaiting official approval. Although a reasonable test could be conducted wearing the FPS by using the current gaseous oxygen, only about 4-5 hours flight time could be realized. Since the new buy of improved 'I' vehicles would include provisions for the FPS, it makes good sense to modify one of the current 'I' vehicles with a LOX supply in order to provide a thorough and complete feasibility testing period for this item in the program; flight times up to 12 hours could then be realized.

5. Improved survivability following emergency descent through provision of increased volume (not weight) within the seat pack, thus allowing for wider latitude in choice of survival equipment and greater ease in packing same. This objective can be achieved simultaneously with that stated in paragraph three above and would be dealt with concurrently.

6. Greater reliability and safety in the total breathing oxygen and suit pressurization systems through improvement and standardization of the inspection and testing procedures and equipment. Action has been initiated on this item and the first prototype is due out of the contractor on or about 15 December and will be sent out to North Base for final test and evaluation. This particular phase of the total program should be expanded to include a study of the overall equipments and procedures currently being used

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during pre- and post-mission activities to determine status of aircrew protective equipment. Specific attention should be given to the development of improved test and check-out equipment which will virtually eliminate the probability of human error during the pre-mission check-out procedures.

**C - Further Action Required**

1. A positive decision by the Chief, OSA and subsequent support and guidance from responsible staff members is needed if this program is to get underway. If a negative decision is reached after due consideration, it is recommended that same be transmitted in written form to the commanders of the Idealist operational units. Otherwise the OSA- R&D personnel, including this consultant, will continue to receive oral and written requests for active prosecution of the improvement program.

2. Notation should be made of the fact that all aspects of this proposed program would be directly contributory to the test and production of a new Idealist vehicle. At the same time, it is the majority opinion that the proposed program should proceed regardless of the ultimate fate of the new vehicle. The improvements recommended can be substantiated and validated on the basis of current operations and equipment; therefore it would appear that only lack of adequate funds would prohibit active prosecution of the program.

3. In the process of pursuing these project activities to date, all contractors except the prime one have been commendably responsive to all requirements placed upon them, both in terms of representation at conferences and submission of proposals and estimates. For reasons largely unknown, the prime vehicle contractor at Van Nuys has thus far ignored requests for his participation in planning conferences and for pertinent information dealing with many vehicular integration questions. Needless to say, the program cannot proceed without the active assistance and cooperation of the prime contractor.

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DF:eo

and then only.

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MEMORANDUM

2 FEB 1970

SUBJECT: U-2C Ejection Seat

1. Request authorization to initiate action with LAC Burbank for an ECP to modify the U-2C ejection system for better low-level escape capabilities. Since the philosophy on the use of the "C" Model is that of first a training aircraft and second a replacement for a destroyed "R" model, the aircraft will almost certainly be around for many years to come. The Air Force has gone to rocket seats for better low-level escape characteristics and in same aircraft as in the U-2R zero-zero escape is provided. This means essentially that a new and inexperienced project pilot is placed in the most hazardous configuration possible when he is asked to learn to fly the U-2C with little chance of escape below two-thousand feet.

2. The current egress system in this aircraft is of the ballistic type and has no low-level altitude escape capability. The dash one indicates bailout below 500 feet and 120 KIA's will almost certainly be unsuccessful. 2,000 feet and 120 KIA's is considered the lowest safe ejection altitude and then only when straight and level.

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STATINTL

3. LAC, in 1966, accomplished a study on modification of the "C" Model escape system at a cost of some  This program was cancelled when it appeared that the "C" Model would phase out and be replaced by the "R". Since this has not come to pass, reconsideration should be given to reopening the issue.

4. Paragraph on number of fatalities



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<u>AIRCRAFT</u>	<u>ALTITUDE</u> (Feet)	<u>AIRSPEED</u>	<u>ZERO LANYARD</u>
T-33	125	120 knots	yes
F-4	GL	50 knots	no
F-104	GL	120 knots	yes
F-105	GL	85 knots	no
F-106	GL	0	no
F-100	100	120 knots	yes
F-102	GL	90 knots	no
F-5	GL	120 knots	yes
T-38	GL	120 knots	yes
T-37	100	120 knots	yes
F-111	GL	0	no <u>capsule</u>
T-28	GL	0 (with yankee system)	
SR-71	GL	0	no
U-2R	GL	0	no
U-2C	500	120 knots	yes

**SECRET**

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IDEA-0040-70  
Copy 2 of 4

5 February 1970

MEMORANDUM FOR: Deputy for Operations, OSA

SUBJECT : U-2C Ejection Seat

1. Reference our discussion on 2 February 1970 above subject, a review has been made of Air Force ejection systems, see Attachment No. 1. These figures should not be misinterpreted, however, in that all the dash one's of the various aircraft recommend bailout at 2,000 feet or higher. The cited minimum altitudes only indicate where it is possible to successfully escape if all systems work properly. In comparing the U-2C Technical Orders, it is readily apparent that this by far is the worst egress system in service for the statement is made that below 500 feet ejection will not be successful.

2. Since the philosophy on the use of the "C" Model is that of first a training aircraft and second a replacement for a destroyed "R" Model, see HQ's Message, [ ] dated 15 October 1969, the aircraft will almost certainly be around for many years to come. This means, essentially, that a new and inexperienced project pilot is placed in the most hazardous configuration possible when he is asked to learn to fly the U-2C. A review of U-2 aircraft accidents bears out the fact that major accidents occur in the early stages of flying the aircraft.

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**SECRET**

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IDEA-0040-70  
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3. Lockheed Aircraft Corporation, in 1966, accomplished a study on modification of the "C" Model escape system. Engineering Research and Development, to provide a low-level escape system, was estimated to cost some [redacted] This program was cancelled when it appeared that the "C" Model would phase out and be replaced by the "R" Model. Since this has not come to pass, reconsideration should now be given to reopening the issue.

[redacted]  
AMS/OSA

Attachments

- 1 - Schedule
- 2 - [redacted] Letter, Same Subject, 1965

AMS/OSA [redacted]

Distribution

- 1 - Addee
- 2 - AMS/OSA
- 3 - " Chrono
- 4 - RB/OSA

[redacted]  
SECRET